

CLAIMS

1. A joy-dial for providing input signals to a device, said joy-dial having a first and a second x-axis input position, a first and a second y-axis input position, and a first and a second directional input position, a joy pad, an elastically deformable diaphragm located below the joy pad corresponding to each of the x-axis and y-axis inputs, a contact located below and associated with each of the diaphragms and arranged so that pressure applied to the joy pad at one of the x- or a y-axis input positions results in deformation of the corresponding diaphragm and closure of the associated contact, and wherein the joy-dial further includes a first and a second directional contact, said first and second directional contacts being arranged so that they are closed upon movement of the joy-dial in a first or a second direction respectively.

2. A joy-dial according to claim 1 further including at least one diagonal input.

3. A joy-dial according to claim 2 having a diagonal input between each of the first y-axis and the second x-axis input, the second x-axis input and the second y-axis input, the second y-axis input and the first x-axis input and the first x-axis input and the first y-axis input.

4. A joy-dial according to claim 2 wherein pressure applied to a diagonal input position on the joy pad results in deformation of the associated diaphragms of the adjacent x- and y-axis inputs and closure of their associated contacts.

5. A joy-dial according to claim 1 further including a central input.

1 6. A joy-dial according to claim 5 wherein pressure applied to a central
2 input position on the joy pad results in deformation of each of the diaphragms
3 and closure of their associated contacts.
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5 7. A joy-dial according to claim 1 further including an engagement means
6 which is engaged during rotation of the joy pad and is arranged to push against
7 a biasing means so as to close the associated first and second directional
8 contact.
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10 8. A joy-dial according to claim 7 wherein the biasing means restores the
11 joy pad to a home position in which none of the contacts are closed once
12 pressure applied by the user is removed.
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14 9. A joy-dial according to claim 1 wherein movement of the joy-dial in the
15 first or the second direction is achieved by respective clockwise and anti-
16 clockwise rotation of the joy pad.
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18 10. A joy-dial according to claim 1 wherein the joy pad can be rotated
19 substantially 45° in either a clockwise or anti-clockwise direction about a z-axis.
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21 11. A joy-dial according to claim 1 further including a base arranged for
22 attachment to an information device or to a printed circuit board of a device and
23 a cage means arranged to be connected to said base and to locate the joy pad
24 there between.
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26 12. A joy-dial according to claim 11 wherein a biasing means is located
27 between the joy pad and an upper surface of the base.
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29 13. A joy-dial according to claim 1 wherein the joy pad is marked to indicate
30 the positioning of the input positions.
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1 14. A joy-dial according to claim 1 wherein the joy pad has an upper surface
2 which is patterned to enhance grip to the joy pad by the user's finger.

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4 15. A joy-dial according to claim 1 wherein the joy pad is mounted for pivotal
5 movement on a pivot means.

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7 16. A joy-dial according to claim 15 wherein the joy pad includes an
8 engaging member on an underside, said engaging member being arranged to
9 engage within a groove formed in an upper surface of said pivot means.

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11 17. A joy-dial according to claim 16 wherein the engaging member is located
12 in a hollow or aperture formed in the underside of the joy pad.

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14 18. A joy-dial according to claim 16 wherein the groove is annular so as to
15 enable the joy pad to turn in a clockwise or anticlockwise direction.

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17 19. A joy-dial according to claim 1 wherein the joy pad includes at least one
18 thumb rail arranged to aid the user to rotate the joy pad.

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20 20. An information device having at least one joy-dial, said joy-dial being
21 arranged to provide input signals to the device, said joy-dial having a first and a
22 second x-axis input position, a first and a second y-axis input position, and a
23 first and a second directional input position, a joy pad, an elastically deformable
24 diaphragm located below the joy pad corresponding to each of the x-axis and y-
25 axis inputs, a contact located below and associated with each of the
26 diaphragms and arranged so that pressure applied to the joy pad at one of the
27 x- or a y-axis input positions results in deformation of the corresponding
28 diaphragm and closure of the associated contact, and wherein the joy-dial
29 further includes a first and a second directional contact, said first and second
30 directional contacts being arranged so that they are closed upon movement of
31 the joy-dial in a first or a second direction respectively.

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1 21. A device according to claim 20 further including a microprocessor or the
2 like which is arranged to detect closure of any of the contacts and to interpret
3 such as a logical state change.

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5 22. A device according to claim 20 further including an operating system
6 which is arranged to be informed by the micro processor of a logical state
7 change and to in turn inform a software application which interprets the
8 information for executing a corresponding or an associated action

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